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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,002	09/16/2003	Ichiro Uchizaki		3909
26021	7590	08/03/2005		
HOGAN & HARTSON L.L.P. 500 S. GRAND AVENUE SUITE 1900 LOS ANGELES, CA 90071-2611			EXAMINER GOLUB, MARCIA A	
			ART UNIT 2828	PAPER NUMBER

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/664,002	Applicant(s) UCHIZAKI ET AL.	
	Examiner Marcia A. Golub	Art Unit 2828	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 September 2003.  
 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-13 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☒ Certified copies of the priority documents have been received in Application No. 09/340349.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>16 September 2003</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Drawings***

Figures 26, 27, 28A, 28B, and 29 should be designated by a legend such as -- Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities:

1) Description of Fig 21 A and B on page 12 should refer to 650 nm wavelength, not 750 nm. 2) Layers 218 and 228 in Fig 9 are being referred to as the second cladding layers or the third cladding layers interchangeably throughout the specification. They are distinct layers and should always be distinguished from layers 216 and 228. 3) In Fig 24 D, distinct cladding layers are being referred to by the same reference number (216 or 226). A distinction should be made between second and third cladding layers. 4) A reference to claims 1 to 5 on page 9 line 5, should be removed since it is possible that the claims may change during prosecution.

Appropriate correction is required.

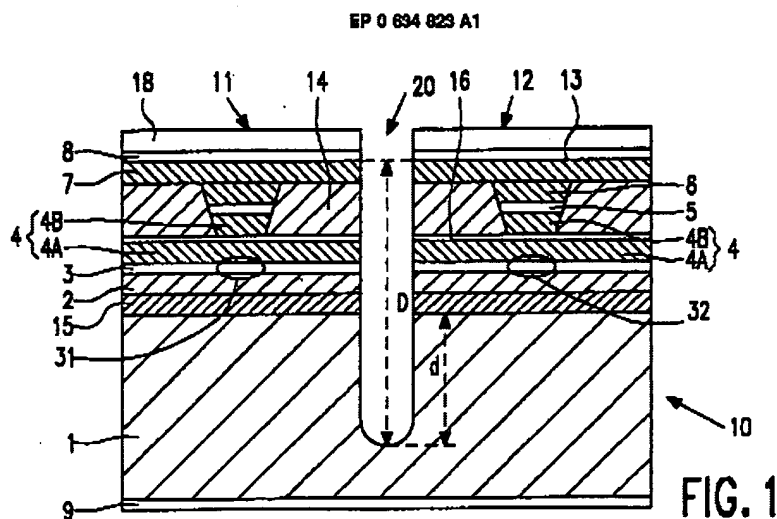
**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 1, 3-6, 10, and 11** are rejected under 35 U.S.C. 102(b) as being anticipated by Valster et al (EP 634,823).



Regarding **Claim 1**, Fig 1 of Valster discloses: "A semiconductor laser array comprising: a GaAs substrate; [1]  
a first laser element portion [11] provided on said substrate to release laser light of a first wavelength;  
a second laser element portion [12] provided on said substrate to release laser light of a second wavelength different from said first wavelength in a direction substantially parallel to the laser light of the first wavelength,

said first laser element portion including a first cladding layer [2], an active layer [3] formed by epitaxially growing a first semiconductor material on said first cladding layer, a second cladding layer [4] formed on said active layer and a current-blocking layer [14] to confine an electrical current injected into said first laser element portion," Valster specifies on page 4 lines 26-27 the semiconductor growing method for the given structure to be MOPVE.

"said second laser element portion including a first cladding layer [2], an active layer [3] formed by epitaxially growing [page 4 lines 26-27] a second semiconductor material on said first cladding layer, a second cladding layer [4] formed on said active layer and a current-blocking layer [14] to confine an electrical current injected into said second laser element portion,

said current-blocking layer of said first laser element portion and said current-blocking layer of said second laser element portion are made of same semiconductor material. [page 3, lines 41-42] " Valster specifies the current blocking layer of both lasers to be made of GaAs

Regarding **Claim 3**, the reference discloses: "The semiconductor laser array as described above,

wherein group-V species included in said second cladding layer of said first laser element portion is not identical to group-v species included in said current-blocking layer of said first laser element portion,

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and group-V species included in said second cladding layer of said second laser element portion is not identical to group-v species included in said current- blocking layer of said second laser element portion.” [page 3, lines 15 and 41-42]

Valster specifies the second cladding layer of first and second lasers to be made of InAlGaP, and the current blocking layer of the first and second lasers made of GaAs. Both P and As come from group V of the periodic table and therefore meet the limitations of the claim.

Regarding **Claims 4, 5, and 6**, the reference discloses: “The semiconductor laser array as disclosed above,

wherein said second cladding layers of said first and second laser element portions are made of same semiconductor material,

wherein said second cladding layers of said first and second laser element portions are made of InGaIP. [page 3 line 15]

wherein said second cladding layer [4B] of said second laser element portion [12] is configured as a ridge stripe extending along laser cavity lengthwise directions and both sides of said ridge stripe is buried by said current-blocking layer [14].”

Regarding **Claim 10**, Fig 1 of Valster discloses:

“a GaAs substrate; [1]

a first laser element portion [11] provided on said substrate to release laser light of a first wavelength;

a second laser element portion [12] provided on said substrate to release laser light of a second wavelength different from said first wavelength in a direction substantially parallel to the laser light of the first wavelength,

said first laser element portion including a first cladding layer [2] made of InGaAlP [page 3 line 14-15], an active layer [3] formed on said first cladding layer, a second cladding layer [4] formed on said active layer and made of InGaAlP [page 3 line 15], a stripe-shaped intermediate layer [5] formed on said second cladding layer and made of a semiconductor material having a smaller band gap than said second cladding layer, and top layer formed to cover said second cladding layer and said intermediate layer and made of a semiconductor material having a smaller band gap than said intermediate layer." Table 1 of Valster specifies that the second cladding layer has a band-gap  $E_G=2.2$  eV, intermediate layer has  $E_G=1.9$  eV, and top layer has  $E_G=1.4$  eV. The band-gap values are in correct order  $2.2>1.9>1.4$ , and therefore meet the limitation of the claim.

"said second laser element portion including a first cladding layer [2] made of InGaAlP [page 3 line 14-15], an active layer [3] formed on said first cladding layer, a second cladding layer [4] formed on said active layer and made of InGaAlP [page 3 line 15], a stripe-shaped intermediate layer [5] formed on said second cladding layer and made of a semiconductor material having a smaller band gap than said second cladding layer, and top layer [5] formed to cover said second cladding layer and said intermediate layer and made of a semiconductor material having a smaller band gap than said intermediate layer." [Table 1]

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Regarding **Claim 11**, Fig 1 of Valster discloses: "The semiconductor laser array as disclosed above, wherein said second cladding layer [4B] of said second laser element portion [12] is configured as a ridge stripe extending along laser cavity lengthwise directions and both sides of said ridge stripe is buried by said current-blocking layer [14].

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 2, 8, 9, and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Valster et al (EP 634,823).

Regarding **Claim 2**, Valster discloses: "The semiconductor laser array as disclosed above," but does not specify that "first and second cladding layers of said first laser element portions are made of AlGaAs, and said first and second cladding layers of said second laser element portions are made of  $\text{InGa}_{1-x}\text{Al}_x\text{P}$  ( $0 < x \leq 1$ ).". However, page 3 line 15 of Valster specifies that the second cladding layer of both lasers is made of InAlGaP. In addition, page 5 lines 1-8 teach that the disclosed invention is not limited to the embodiment given. Different composition of chosen semiconductor materials can be used and the semiconductor materials used can come from other material systems such as GaAs/AlGaAs.



It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Valster into the device disclosed by Valster by making first and second cladding layers of the first laser of AlGaAs, and first and second cladding layers of the second laser of  $\text{InGa}_{1-x}\text{Al}_x\text{P}$  ( $0 < x \leq 1$ ). The ordinary artisan would have been motivated to modify the device of Valster in the manner set forth above for at least the purpose of creating a laser array where each laser is lasing at a different wavelength.

Regarding **Claim 8 and 13**, Valster discloses: "The semiconductor laser array as disclosed above,

wherein said active layer of said second laser element portion includes an  $\text{In}(\text{Ga}_{1-y}\text{Al}_y)\text{P}$  ( $0 \leq y \leq 0.2$ ) layer." Page 3 line 15 of Valster specifies the active layer to be made of InGaP, which is the case when  $y=0$  in  $\text{In}(\text{Ga}_{1-y}\text{Al}_y)\text{P}$  ( $0 \leq y \leq 0.2$ ).

Valster does not disclose that "the active layer of said first laser element portion includes an AlGaAs layer", however page 5 lines 1-8 of Valster teaches that the disclosed invention is not limited to the embodiment given. Different composition of chosen semiconductor materials can be used and the semiconductor materials used can come from other material systems such as GaAs/AlGaAs.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Valster into the device disclosed by Valster by making active layer of the first laser that includes an AlGaAs layer. The ordinary artisan would have been motivated to modify the device of Valster in the

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manner set forth above for at least the purpose of creating a laser array where each laser is lasing at a different wavelength.

Regarding **Claim 9**, Valster discloses: "The semiconductor laser array as disclosed above," but does not specify that "active layer of said first laser element portion has a bulk structure and said active layer of said second laser element portion has a multiple-quantum well structure." However page 5 lines 1-8 of Valster teaches that the disclosed invention is not limited to the embodiment given, and that the active layer may comprise a multi-quantum well layer structure.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Valster into the device disclosed by Valster by making active layer of the first laser with a bulk structure, and the active layer of the second laser with a MQW structure. The ordinary artisan would have been motivated to modify the device of Valster in the manner set forth above for at least the purpose of creating a laser array where each laser is lasing at a different wavelength.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

**Claims 1, 10, and 12** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 6, and 8 of U.S. Patent No. 6,646,975 (hereafter '975). Although the conflicting claims are not identical, they are not patentably distinct from each other because '975 provides the claimed subject matter.

Regarding **Claim 1**, '975 claims: "a GaAs substrate; (claim 4 line 2)

a first laser element portion provided on said substrate to release laser light of a first wavelength; (claim 1 lines 2-6)

a second laser element portion provided on said substrate to release laser light of a second wavelength different from said first wavelength in a direction substantially parallel to the laser light of the first wavelength, (claim 1 lines 2-4 and 6-9)

said first laser element portion including a first cladding layer, an active layer formed by epitaxially growing a first semiconductor material on said first cladding layer,

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a second cladding layer formed on said active layer and a current-blocking layer to confine an electrical current injected into said first laser element portion, (claim 4 lines 5-10)

said second laser element portion including a first cladding layer, an active layer formed by epitaxially growing a second semiconductor material on said first cladding layer, a second cladding layer formed on said active layer and a current-blocking layer to confine an electrical current injected into said second laser element portion, (claim 4 lines 11-15)

said current-blocking layer of said first laser element portion and said current-blocking layer of said second laser element portion are made of same semiconductor material. (claim 4 lines 16-19)"

Regarding **Claim 10**, '975 claims: "a GaAs substrate; (claim 6 line 2)

a first laser element portion provided on said substrate to release laser light of a first wavelength; (claim 1 lines 2-6)

a second laser element portion provided on said substrate to release laser light of a second wavelength different from said first wavelength in a direction substantially parallel to the laser light of the first wavelength, (claim 1 lines 2-4 and 6-9)

said first laser element portion including a first cladding layer made of InGaAlP, an active layer formed on said first cladding layer, a second cladding layer formed on said active layer and made of InGaAlP, a stripe-shaped intermediate layer formed on said second cladding layer and made of a semiconductor material having a smaller band gap than said second cladding layer, and top layer formed to cover said second

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cladding layer and said intermediate layer and made of a semiconductor material having a smaller band gap than said intermediate layer. (claim 6 lines 5-15)

said second laser element portion including a first cladding layer made of InGaAlP, an active layer formed on said first cladding layer, a second cladding layer formed on said active layer and made of InGaAlP, a stripe-shaped intermediate layer formed on said second cladding layer and made of a semiconductor material having a smaller band gap than said second cladding layer, and top layer formed to cover said second cladding layer and said intermediate layer and made of a semiconductor material having a smaller band gap than said intermediate layer. (claim 6 line 16-26)"

Regarding **Claim 12**, '975 claims: "The semiconductor laser array as disclosed above (claims 1 and 6),

wherein said first wavelength ranges about 780 nm as its center, and said second wavelength ranges about one of 635 nm, 650 nm and 685 nm as its center. (claim 8 lines 1-4)"

**Claims 3-5, and 7** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 6 and 8 of U.S. Patent No. 6,646,975 in view of Valster et al (EP 634,823).

Regarding **Claim 3**, Valster discloses: "The semiconductor laser array as described above,

wherein group-V species included in said second cladding layer of said first laser element portion is not identical to group-v species included in said current-blocking layer of said first laser element portion,

and group-V species included in said second cladding layer of said second laser element portion is not identical to group-v species included in said current- blocking layer of said second laser element portion.” [page 3, lines 15 and 41-42]

Prior patent '975 claims the second cladding layer of the first and second lasers to be made of InGaAlP (claim 6, lines 7-8), but does not specify which material is used for the current blocking layer. However, Valster specifies the second cladding layer of first and second lasers to be made of InAlGaP, and the current blocking layer of the first and second lasers made of GaAs. Both P and As come from group V of the periodic table and therefore meet the limitations of the claim.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Valster into the device disclosed by the prior patent by making a current blocking layer out of As containing material, such as GaAs. The ordinary artisan would have been motivated to modify the device disclosed by the prior patent in the manner set forth above for at least the purpose of creating a layer of higher resistance than the cladding layer in order to confine the current path inside the laser cavity.

Regarding **Claims 4, 5, and 7**, '975 claims:

“The semiconductor laser array as disclosed above,

wherein said second cladding layers of said first and second laser element portions are made of same semiconductor material.

wherein said second cladding layers of said first and second laser element portions are made of InGaIP. (claim 6 lines 7-8 and 18-19)

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wherein said first wavelength ranges about 780 nm as its center, and said second wavelength ranges about one of 635 nm, 650 nm and 685 nm as its center.  
(claim 8 lines 1-4)"

***Fax/Telephone Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcia A. Golub.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marcia A. Golub

*Zandra V Smith*  
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Primary Examiner  
7/28/05